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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/633,869	08/07/2000	Hongyong Zhang	0756-2100	6768

7590

05/24/2002

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EXAMINER

SIMKOVIC, VIKTOR

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 05/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/633,869

Applicant(s)

ZHANG ET AL.

Examiner

Viktor Simkovic

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-72 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-72 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 10, and 31 are provisionally rejected under the judicially created doctrine of double patenting over claims 1,8,17,24 of copending Application No. 09/615,842. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: While the present application claims a rectangular cross section of the laser beam and Application No. 09/615,842 claims a linear cross section, the two are essentially the same, since in practice a linear cross section will necessarily have a rectangular shape (albeit of a minimal thickness). Although the claims of the present invention refer to scanning the

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laser beam in a direction parallel to the channel direction, as explained below, there is no evidence that this would lead to new or unexpected results, and thus one of ordinary skill in the art would find no difference in the scanning direction.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claims 20-24 and 28-29 rejected under 35 U.S.C. 103(a) as being unpatentable over Chae as applied to claim 1 above, and further in view of Weiner et al. Claim 21 introduces the additional limitation of implanting a dopant into the substrate before the laser irradiation. Such steps are well known in the art. See, for example, Weiner et al., column 1, lines 18-22. It would have been obvious to one of ordinary skill in the art at the time of the invention to introduce a dopant, as the step of laser irradiating would also diffuse the impurity during the crystallization. With regards to claims 28-29, while Chae does not specify exactly 10 pulses, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller* 105 USPQ 233, 255 (CCPA 1955).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2,6,8,10-13,17,19,31-35, 37-38, 41-42, 44, 46-49, 52-53, 55, 58-60, 63-64, 66-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chae. Chae teaches a method fabricating a semiconductor device having at least one thin film transistor comprising a channel region and a gate electrode, comprising the steps of:

forming a structure comprising an amorphous semiconductor thin film separated by a gate insulating film from a gate electrode on an insulating substrate;

irradiating said amorphous semiconducting film with a laser light to convert it to a polycrystalline film wherein said laser beam has a rectangular shaped cross section at said substrate, while relatively moving said laser beam along a scan direction across the substrate. See column 3, lines 45-68, and Figure 7.

Chae fails to teach, however, that the scanning direction of the laser beam be parallel to the channel direction. The examiner, maintains, however, that it would have been obvious to one of ordinary skill in the art at the time of the invention to do so, since there is no difference in the quality or properties of the crystallized film. Chae does not state any differences in properties depending on the scanning direction, and more importantly, neither does the applicant. the specification does not mention scanning along the channel direction, nor why this would be advantageous or lead to different and unexpected results. In fact, the only support for this comes from Figures 2 and 7. However, in Figure 1, the scanning is first done perpendicular to the channel direction. In Figures 2 and 7, there are both column drivers and scan drivers, and the two are

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perpendicular to each other. Therefore no matter which direction is scanned across, one of the two will be scanned along the channel direction, while the other will not.

With regard to claim 8, the peripheral circuit is a column driver.

With regard to claim 13, the beams are overlapping.

With regard to claims 32 and 33, the substrate contains both an active matrix circuit and a peripheral driving circuit.

Claims 20-24 and 28-29 as well as 43, 45, 54, 56-57, 65, 72 rejected under 35 U.S.C. 103(a) as being unpatentable over Chae as applied to claim 1 above, and further in view of Weiner et al. Claim 21 introduces the additional limitation of implanting a dopant into the substrate before the laser irradiation. Such steps are well known in the art. See, for example, Weiner et al., column 1, lines 18-22. It would have been obvious to one of ordinary skill in the art at the time of the invention to introduce a dopant, as the step of laser irradiating would also diffuse the impurity during the crystallization. With regards to claims 28-29, 43, 54, 65, while Chae does not specify exactly 10 pulses, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller* 105 USPQ 233, 255 (CCPA 1955).

Claims 3-5,7,9,14-16, 25-27,30, 36, 39-40, 50, 51, 61, 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chae as applied to claim 1 above, and further in view of Fehlner et al. While Chae does not specifically teach heating the film during the irradiation, Fehler et al. teach such a step (see column 3, lines 25-38). It would

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have been obvious to one of ordinary skill in the art at the time of the invention since as Fehler et al. teach, this reduces the amount of laser power necessary to effect the crystallization. With regards to claims 4, 15, 26, 40, 62 the use of a metal catalyst to promote crystallization is well known in the art and official notice is hereby taken. With regards to claims 5, 16, 27, top gate electrode TFTs are well known in the art and the process would be no different for such a device. With regard to claims 7, 15, 30, see the comments included under the rejection of claim 21. Finally, with regards to claim 36, the formation of source and drain regions is well known in the manufacture of TFT devices.

Response to Arguments

Applicant argues that the Chae et al. reference does not specifically teach moving the laser light in a direction parallel to the channel direction. Applicant also states that the examiner has used hindsight reasoning to reach the conclusion that it would have been obvious to scan in a direction parallel to the channel direction. Applicant also maintained that the advantages of a claimed invention need not be expressly enumerated in the specification.

However, the issue here is one of new and unexpected results. The examiner, in a previous rejection, maintained that since one of ordinary skill in the art would discern no difference in the resulting device as a result of scanning direction, the wafers might be scanned in any direction, including in a direction parallel to the channel direction, even though this was not stated by Chae et al. In fact, Chae et al. do not state

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a preferred scanning direction, thus the prior state of the art indicates that this makes no difference. There is nothing in the specification to indicate any new or unexpected results from scanning in the direction parallel to the channel direction. Since the examiner has made an obviousness rejection, the burden of proof is upon the applicant to show evidence of new and unexpected results. Applicant argues in the response that scanning in a direction parallel to the channel direction results in enhanced carrier mobility. However, a showing of unexpected results must be based on evidence, not argument or speculation. *In re Maine* 104 F.3d 1339, 1343-44, 41 USPQ2d 1451, 1455, -56 (Fed. Cir. 1997). Additionally, the evidence must be reasonably commensurate in scope with the claimed invention. *In re Kulling*, 897 F.2d 1147, 1149, 14 USPQ2d 1056, 1058 (Fed. Cir. 1990); *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 777 (Fed. Cir. 1983).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Since there is nothing in the disclosure with regard to the advantages of scanning in a particular direction, the examiner could glean no such knowledge from the applicant's disclosure.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

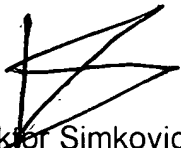
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viktor Simkovic whose telephone number is 703-308-6170. The examiner can normally be reached on Mon - Fri, 9:00 - 6:00, except every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 703-308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Viktor Simkovic
May 20, 2002



John F. Niebling
Supervisory Patent Examiner
Technology Center 2600